

WHAT IS CLAIMED IS:

1. A method for manufacturing a semiconductor device wherein for a substrate as a workpiece in which an insulation film is formed to the substrate, openings are formed in the insulation film, a first conductive film is formed in the inside of the openings and on the surface of the insulation film, and a second conductive film is formed on the first conductive film, by planarizing the second conductive film and part of the first conductive film using a fixed abrasive tool, the first and the second planarized conductive film are formed in the openings, said method comprising:

supplying a first processing liquid upon planarization of the second conductive film and switching the supply of the liquid from the first processing liquid to the second processing liquid upon planarization of the second and the first conductive film.

2. A method for manufacturing a semiconductor device wherein for a substrate as a workpiece in which an insulation film is formed to the substrate, openings are formed in the insulation film, a first conductive film is formed in the inside of the openings and on the surface of the insulation film, and a second conductive film is formed on the first conductive film, by planarizing the second conductive film and part of the first conductive film using a fixed abrasive tool,

the first and the second planarized conductive film are formed in the openings, said method comprising:

 dressing the surface of the fixed abrasive tool before planarization of the second and the first conductive film.

5 \3. A method for manufacturing a semiconductor device wherein for a substrate as a workpiece in which an insulation film is formed to the substrate, openings are formed in the insulation film, a first conductive film is formed in the inside of the openings and on the surface of the insulation
10 film, and a second conductive film is formed on the first conductive film, by planarizing the second conductive film and part of the first conductive film using a fixed abrasive tool, the first and the second planarized conductive film are formed in the openings, said method comprising:

15 supplying a first processing liquid upon planarization of the second conductive film and switching the supply of the processing liquid from the first processing liquid to the second processing liquid upon planarization for the second and the first conductive film; and

20 dressing the surface of the fixed abrasive tool before planarization of the second and the first conductive film.

4. A method for manufacturing a semiconductor device as defined in claim 1, wherein the distance of the insulative film between adjacent openings is within a range of 30 μm to
25 0.1 μm , and dishing and erosion on the planarized surface is

40 nm or less.

5. A method for manufacturing a semiconductor device as defined in claims 1, wherein each of the first and the second processing liquid contains an oxidizing agent, an organic acid,
5 a corrosion inhibitor and purified water.

6. A method for manufacturing a semiconductor device as defined in claim 5, wherein each of the first and the second processing liquid contains aqueous hydrogen peroxide, malic acid, benzotriazole and purified water.

10 7. A method for manufacturing a semiconductor device as defined in claim 6, wherein each of the first and the second processing liquid contains from 0.5 to 50% of aqueous hydrogen peroxide, from 0.1 to 0.2% of malic acid and from 0.1 to 0.4% of benzotriazole.

15 8. A method for manufacturing a semiconductor device as defined in claim 5, wherein the concentration of the oxidizing agent is different between the first and the second processing liquid.

20 9. A method for manufacturing a semiconductor device as defined in claim 1, wherein the abrasive grains of the fixed abrasive tool comprise fumed silica and the abrasive grains are fixed with a resin.

25 10. A method for manufacturing a semiconductor device as defined in claim 9, wherein the fumed silica abrasive grains are fixed with a resin and a compression modulus of

elasticity is from 500 MPa to 1000 MPa.

11. A method for manufacturing a semiconductor device as defined in claim 2, wherein the dressing is conducted by using a diamond dresser and the height of the diamond dresser
5 from the surface of the fixed abrasive tool can be positioned.

12. An apparatus for manufacturing a semiconductor device, the semiconductor device being planarized, including:

a rotational table;

a polishing tool secured to the rotational table;

10 a device for dressing the surface of the polishing tool;

at least two polishing liquid supply systems;

a pressing device for holding a substrate and transmitting a processing load to the substrate; and

15 wherein the rotational table and the dressing device can be positioned relative to a reference plane.

13. An apparatus for manufacturing a semiconductor device as defined in claim 12, wherein the dressing device is a diamond dresser.

20 14. An apparatus for manufacturing a semiconductor device as defined in claim 12, wherein the polishing tool is a fixed abrasive tool.

15 15. An apparatus for manufacturing a semiconductor device as defined in claim 14, wherein the abrasive grains of the fixed abrasive tool are fumed silica and fixed with a

resin.

16. An apparatus for manufacturing a semiconductor device as defined in claim 14, wherein the compression modulus of elasticity of the fixed abrasive tool is from 500 MPa to
5 1000 MPa.

17. A method for manufacturing a semiconductor device as defined in claim 2, wherein the distance of the insulative film between adjacent openings is within a range of 30 μm to 0.1 μm , and dishing and erosion on the planarized surface is
10 40 nm or less.

18. A method for manufacturing a semiconductor device as defined in claims 3, wherein each of the first and the second processing liquid contains an oxidizing agent, an organic acid, a corrosion inhibitor and purified water.

19. A method for manufacturing a semiconductor device as defined in claim 2, wherein the abrasive grains of the fixed abrasive tool comprise fumed silica and the abrasive grains are fixed with a resin.
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